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Waste Acceptance Criteria for ICDF Evaporation Pond (60% Design Component)



Idaho National Engineering and Environmental Laboratory

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**Prepared for the
U.S. Department of Energy
Idaho Operations Office**

ABSTRACT

The INEEL CERCLA Disposal Facility evaporation pond will accept Comprehensive Environmental Response, Compensation, and Liability Act wastes generated within the Waste Area Group 3 area of contamination and other Idaho National Engineering and Environmental Laboratory Waste Area Group area of contamination boundaries. Hazardous, mixed, and low-level, wastes will be accepted for disposal at the ICDF evaporation pond. The purpose of this Waste Acceptance Criteria document is to provide the basis for the quantities of radioactive and non-radioactive wastes allowable in waste designated for disposal in the ICDF evaporation pond.

The evaporation pond is designated as a Corrective Action Management Unit in accordance with the substantive requirements of IDAPA 58.01.05.008 (40 CFR 264.552) and designed to meet 40 CFR 264 Subpart K and CC for the purpose of managing ICDF landfill leachate and other aqueous wastes generated as a result of operating the ICDF Complex (Operable Unit 3-13 Record of Decision).

The ICDF Complex Waste Acceptance Criteria is the master document for all waste coming into the ICDF Complex. The purpose of this evaporation pond Waste Acceptance Criteria is to provide the basis for the quantities of radioactive and non-radioactive contaminants that may be present in the aqueous wastes disposed in the ICDF evaporation pond and the basis for its operation. The aqueous wastes will include leachate from the ICDF landfill, purge and development water from monitoring well drilling operations, secondary aqueous wastes generated from waste processing and decontamination activities in the Staging, Storage, Sizing, and Treatment Facility, and other Idaho National Engineering and Environmental Laboratory Comprehensive Environmental Response, Compensation, and Liability Act projects.

Compliance with the requirements of the evaporation pond Waste Acceptance Criteria will ensure protection of human health and the environment. This document defines responsibilities, identifies the waste acceptance process, and provides the regulatory citations used in the development of the evaporation pond aqueous Waste Acceptance Criteria, and the acceptable numerical concentrations for the waste constituents.

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ACRONYMS

ALARA	as low as reasonably achievable
ARAR	applicable or relevant and appropriate requirement
CAMU	Corrective Action Management Unit
cm/sec	centimeters per second
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
DOE	U.S. Department of Energy
DOE-ID	Department of Energy, Idaho Operations Office
DOT	Department of Transportation
EDF	Engineering Design File
EPA	Environmental Protection Agency
ER	environmental restoration
FGE	fissile gram equivalent
GCL	geosynthetic clay liner
HDPE	high-density polyethylene
HWMA	Idaho Hazardous Waste Management Act
ICDF	INEEL CERCLA Disposal Facility
IDAPA	Idaho Administrative Procedures Act
IDEQ	Idaho Department of Environmental Quality
IDW	investigation-derived waste
INEEL	Idaho National Engineering and Environmental Laboratory
INTEC	Idaho Nuclear Technology and Engineering Center
LDR	land disposal restriction
mm	millimeter
m/Rem	millirem

MEI	maximally exposed individual
NESHAP	National Emission Standard for Hazardous Air Pollutant
O&M	operation and maintenance
OU	operable unit
PCB	polychlorinated biphenyl
PPE	personal protective equipment
PPM	parts per million
QA	quality assurance
RCRA	Resource Conservation and Recovery Act
RAO	remedial action objective
RBC	risk-based criteria
RD	remedial design
RD/RA	remedial design/remedial action
RME	reasonably maximally exposed
ROD	record of decision
SRPA	Snake River Plain Aquifer
SSA	Staging and Storage Annex
SSSTF	Staging, Sizing, Storage, and Treatment Facility
TRA	Test Reactor Area
TRU	transuranic
TSCA	Toxic Substances Control Act
VO	volatile organic
WAC	Waste Acceptance Criteria
WAG	Waste Area Group
WMP	Waste Management Plan

NOMENCLATURE

The following definitions are presented as an aid to reader understanding of technical and scientific terms used within this document.

Analytical residue and sample preservative residue: Aqueous and organic solutions from sample preservatives and analytical residue generated from field preparation and laboratory analyses.

CERCLA-derived remediation and removal wastes: Wastes from Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) activities that may include, but are not limited to, soil, water, contaminated personal protective equipment (PPE), filters, and other support equipment that cannot be decontaminated.

Construction wastes: Wastes generated during the on-Site construction of environmental remedial action activities.

Contaminated media/contained-in policy: All media contaminated with listed waste excavated prior to characterization will be assumed to contain listed waste.

Drill cuttings: Cuttings generated from well installation activities. Perched water and Snake River Plain Aquifer (SRPA) water well installation is expected to generate a substantial volume of drill cuttings.

Facility: An area within the boundaries of a Department of Energy (DOE)-controlled site that is access-controlled to prevent public access, for example, Test Reactor Area (TRA), Idaho Nuclear Technology and Engineering Center (INTEC).

Free liquids: Liquids that can readily separate from the solid portion of a waste under ambient temperature and pressure (DOE Order 435.1), as demonstrated by “EPA Paint Filter Liquids Test Method 9095.”

Hazardous substances: Any material designated as such pursuant to the CERCLA, including all Resource Conservation and Recovery Act (RCRA) hazardous wastes, radionuclides, a variety of other chemical substances, and any material identified as a hazardous substance such as petroleum, petroleum products, and all hazardous wastes.

Hazardous waste: Waste designated as hazardous by the Environmental Protection Agency (EPA) regulations (40 CFR 261.3) and regulated under RCRA.

High-level waste: Highly radioactive waste material. High-level waste results from the reprocessing of spent nuclear fuel, including the liquid waste produced directly during reprocessing. As per DOE Order 435.1, the term refers to any solid material derived from such liquid waste that contains fission products in sufficient concentrations, and to other highly radioactive material that is determined, consistent with existing law, to require permanent isolation. (Adapted from: Nuclear Waste Policy Act of 1982, as amended.)

Hydraulic spills: Spills that occur when hydraulic fluid leaks from equipment seals or through ruptured hoses.

Investigation-derived waste: Materials that are generated from CERCLA investigations, such as drill cuttings, purge water overburden, interstitial and under burden soils, and wastes (debris, sludge, etc.).

Infectious waste: Waste containing living organisms that could endanger human health or the health of domestic animals or wildlife by extending the range of biological pests, viruses, pathogenic microorganisms, or other agents capable of infesting, infecting, or extensively and permanently altering the normal populations of organisms.

Low-level radioactive waste: Waste that cannot be defined as high-level radioactive waste, spent nuclear fuel, transuranic (TRU) waste, by-product material (as defined in Section 11e. (2) of the Atomic Energy Act of 1954, as amended), or naturally occurring radioactive material (DOE Order 435.1).

Mixed waste: Waste containing both radioactive components as defined by the Atomic Energy Act of 1954 (as amended), and hazardous components as defined by 40 CFR 262.

Polychlorinated biphenyl (PCB) Waste: For disposal in the ICDF landfill, PCB waste is defined as wastes containing greater than 50 mg/kg and less than 500 mg/kg PCBs.

Purge/development water: Water generated from well development or during sampling that is removed from a well before samples are collected.

Radioactive waste: Solid, liquid, or gaseous material that contains radionuclides regulated under the Atomic Energy Act of 1954 (as amended), which is of negligible economic value considering costs of recovery.

Sample containers. Vessels composed of steel, aluminum, Teflon, brass, glass, or plastic used to contain samples of water, soil, or other media. Once used, these containers become a waste stream if they cannot be decontaminated for reuse.

Secondary waste: A generic category of wastes that are generated from support activities (including operation and maintenance [O&M] activities) related to retrieving, processing, and packaging the materials. Examples of secondary wastes include waste associated with routine decontamination activities (excluding facility closure), PPE, administrative area and support services wastes, used equipment and filters, and other similar wastes generated during O&M activities.

Special case waste: Waste with TRU constituents exceeding 10nCi/g, polychlorinated biphenyl (PCB) waste, and other waste not routinely expected to be processed through the Staging, Sizing, Storage, and Treatment Facility (SSSTF). Special case waste may include waste that will be classified as TRU waste following analysis.

Spent nuclear fuel: Fuel that has been withdrawn from a nuclear reactor following irradiation and that has not yet been reprocessed to remove its constituent elements.

Toxic Substances Control Act (TSCA) waste: Waste managed strictly under TSCA regulations. At this time, only PCBs and asbestos are regulated under TSCA as waste.

Transuranic waste: Per DOE Order 435.1, radioactive waste containing more than 100 nanocuries (3,700 becquerels) of alpha-emitting TRU isotopes per gram of waste, with half-lives greater than 20 years, except for (1) high-level radioactive waste; (2) waste that the Secretary of Energy has determined, with the concurrence of the administrator of the EPA, does not need the degree of isolation required by the 40 CFR Part 191 disposal regulations; or (3) waste that the Nuclear Regulatory Commission (NRC) has approved for disposal on a case-by-case basis in accordance with 10 CFR Part 61. (Source: WIPP Land Withdrawal Act of 1992, as amended.)

Unused and unaltered sample material: Material that may include excess soil cores from the interbeds, underlying basalt, and groundwater.

Waste Acceptance Criteria for ICDF Evaporation Pond (60% Design Component)

1. INTRODUCTION

The U.S. Department of Energy Idaho Operations Office (DOE-ID) authorized a remedial design/remedial action (RD/RA) for the Idaho Nuclear Technology and Engineering Center (INTEC) in accordance with the Waste Area Group (WAG) 3, Operable Unit (OU) 3-13 Record of Decision (ROD) (DOE-ID 1999a).

The OU 3-13 ROD requires Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) remediation wastes generated within the INTEC boundaries to be removed and disposed on-site in the Idaho National Engineering and Environmental Laboratory (INEEL) CERCLA Disposal Facility (ICDF). The ICDF Complex, which will be located south of INTEC and adjacent to the existing percolation ponds, will be an on-Site, engineered facility, meeting DOE Order 435.1, Resource Conservation and Recovery Act (RCRA) Subtitle C, Idaho Hazardous Waste Management Act (HWMA), and Toxic Substance Control Act (TSCA) polychlorinated biphenyl (PCB) landfill design and construction requirements. The ICDF Complex will include the necessary subsystems and support facilities to provide a complete waste disposal system. The major components of the ICDF Complex are the disposal cells (landfill), an evaporation pond (comprised of 2 cells), and the Staging, Sizing, Storage, and Treatment Facility (SSSTF).

Only low-level, mixed low-level, hazardous, and limited quantities of TSCA PCB wastes will be treated and/or disposed at the ICDF Complex. Most of the waste will be contaminated soil, but debris and investigation-derived waste (IDW) will also be included in the waste inventory.

The ICDF evaporation pond system consists of two 2,200,000-gallon capacity ponds that will contain leachate generated from the ICDF landfill, as well as additional inflows from other sources including direct precipitation, washdown water for trucks and equipment, and purge/development water.

The ICDF evaporation pond will accept ICDF landfill leachate, decontamination water, CERCLA well purging, sampling, and well development water, and waste from other CERCLA activities (that meet the ICDF evaporation pond Waste Acceptance Criteria [WAC]) for disposal. The ICDF evaporation pond is designated as a RCRA Corrective Action Management Unit (CAMU) in the OU 3-13 ROD. As a CAMU, the ICDF evaporation pond is designed and constructed to accept leachate from the ICDF landfill. Aqueous waste generated by on-Site CERCLA projects that meets this WAC can also be disposed to the ICDF evaporation pond.

1.1 Purpose and Objectives

The purpose of this WAC is to provide the limits for the quantities of radioactive and non-radioactive constituents that may be present in ICDF landfill leachate and other CERCLA-generated aqueous waste for disposal to the ICDF evaporation pond.

The objectives of the ICDF Evaporation Pond WAC are to ensure that:

- The commitments in the OU 3-13 ROD are met and maintained.

- The waste received at the ICDF evaporation pond contains only the radionuclides and hazardous constituents that the facility can safely manage.
- The concentrations and/or total activities of the waste received at the ICDF evaporation pond are compatible with the ICDF evaporation pond design and operations.
- That aqueous waste received at the ICDF evaporation pond does not contain materials that will compromise the safety or integrity of the facility under the expected operating conditions.

1.2 Scope

The ICDF evaporation pond is a CAMU designed and designated to accept ICDF landfill leachate, decontamination water, water from CERCLA well purging and sampling and other CERCLA activities and aqueous wastes generated within the ICDF Complex and from CERCLA removal/remedial and investigative activities at the INEEL WAGs that meet the ICDF Evaporation Pond WAC for disposal. The ICDF leachate will be pumped directly to the ICDF evaporation pond. The pump system will track the volume of waste disposed to the pond. The ICDF evaporation pond system consists of two 2,200,000-gallon capacity ponds that will contain leachate generated from the ICDF landfill, as well as additional inflows from other sources including direct precipitation, washdown water for trucks and equipment, and purge/development water. The ponds are lined with a RCRA Subtitle C liner, "Pond Lining System Equivalency Analysis," EDF-ER-312 (DOE-2001a).

The ICDF Complex users must specify and obtain approval from the ICDF Complex Operations Manager prior to shipment. Aqueous wastes that can be accepted at the ICDF evaporation pond include:

- ICDF landfill leachate
- Aqueous wastes generated in the ICDF Complex and from CERCLA investigative, remedial, and removal activities at the INEEL WAGs
- Secondary aqueous wastes from waste processing and decontamination activities in the SSSTF and INEEL WAGs
- Purge and development water from CERCLA monitoring wells.

1.2.1 Waste Streams and Volumes for the Evaporation Pond

The aqueous wastes that will be generated at the ICDF and the INEEL WAGs are as follows:

- **ICDF landfill leachate.** The design and operation of the ICDF landfill will include provisions for leachate monitoring and management. The leachate will be disposed in the ICDF evaporation pond with no treatment. The quantity of leachate will vary with the rate of precipitation and the uncovered surface area of the ICDF landfill.
- **Aqueous wastes generated in the ICDF Complex and from CERCLA investigative, remedial, and removal activities at the INEEL WAGs.** The aqueous wastes generated inside the ICDF will be capable of being sent to the ICDF evaporation pond directly. The aqueous wastes generated outside the ICDF will be sampled and a waste profile completed by the waste generator prior to the waste being shipped to the ICDF Complex for disposal in the ICDF evaporation pond. All of the waste in the current design basis inventory can be accepted into the ICDF evaporation pond without treatment.

- **Secondary aqueous wastes from waste processing and decontamination activities inside the SSSTF and ICDF Complex.** The quantity of aqueous waste generated from decontamination activities is expected to be minimal. All secondary aqueous wastes generated by decontamination activities will be capable of being disposed in the ICDF evaporation pond without treatment.
- **Purge and development water from monitoring wells.** It is estimated that approximately 263,000 gallons of monitoring well purge and development water will be generated prior to the middle of the year 2003 when the ICDF evaporation pond is expected to become operational. This water will be stored in tanks at the SSA until the ICDF evaporation pond is ready to accept it. After the ICDF evaporation pond becomes operational, the peak purge and development water generation rate is estimated to be 35,000 gal/year. The purge water generated prior to the opening of the ICDF evaporation pond will be sampled, analyzed, and profiled prior to disposal. The projected inventory of purge and development water can be accepted into the ICDF evaporation pond without treatment.

1.2.2 CAMU Designation and Land Disposal Restrictions

The OU 3-13 ROD designates the ICDF evaporation pond as a CAMU. A CAMU is defined as “an area within a facility that is used only for managing remediation wastes for implementing corrective action or clean-up at the facility” (40 CFR 260.10). Placement of remediation wastes into or within a CAMU does not constitute land disposal of hazardous wastes (40 CFR 264 Subpart S (a)(1)). The operational philosophy for the evaporation pond will be implemented through the WACs and ICDF Complex O&M Plan.

1.3 Roadmap to the Waste Acceptance Criteria

The ICDF Evaporation Pond WAC is a subset of the ICDF Complex WAC (DOE-ID 2001b). The primary elements of the ICDF evaporation pond waste acceptance requirements can be found in the following locations:

- Criteria basis is found in Section 4 of this Evaporation Pond WAC
- WAC is found in Section 5 of this Evaporation Pond WAC
- Waste content or concentration accepted at the ICDF evaporation pond is found in Section 5 of this Evaporation Pond WAC
- Prohibitions are found in Section 5-1 of the ICDF Complex WAC (DOE-ID 2001b) and in Section 5.2 of this Evaporation Pond WAC
- Non-conforming waste is described in Section 3.8 of the ICDF Complex WAC (DOE-ID 2001b).

Table 1-1. Cross-reference of ICDF Complex WAC and Evaporation Pond WAC.

Function	ICDF Complex WAC Section
Responsibilities	1.5
General requirements of the waste profile process	2.1
Exceptions to WAC requirements (case-by-case acceptance)	2.2.1
General classes of waste	2.2

Table 1-1. (continued).

Function	ICDF Complex WAC Section
Waste form requirements	2.2
Composition and waste containers	2.3
Physical and chemical characterization requirements	2.4
Type of acceptable knowledge	2.4.1
Radiological characterization	2.5
Waste acceptance process	3
Waste acceptance scheduling requirements	3.2
Waste tracking system	3.3
Data quality objectives	3.4
Waste profile	3.5
Waste certification process	3.6
Verification as packaged	3.7
Receipt verification	3.8
Non-conforming waste	3.9
Records	3.10
Packaging and shipping	3.11
Prohibitions	5.1
Criticality safety limits	5.4.3
Packaging criteria	5.5
Outer package criteria	5.5.1
Container requirements	5.5
Condition of containers	5.5.2
Package labeling and marking	5.5.6

1.4 Relationship to Other Documents

This ICDF Evaporation Pond WAC is based on and integrates with several related documents, as discussed below.

1.4.1 OU 3-13 Record of Decision

The OU 3-13 ROD (DOE-ID 1999a) is the regulatory authorization for the ICDF Complex. It includes the regulatory basis for the ICDF landfill, and the applicable or relevant and appropriate requirements (ARARs) that the ICDF Complex must meet. The OU 3-13 ROD designates the ICDF evaporation pond as a CAMU that will be designed and constructed to accept the ICDF leachate and other aqueous wastes generated from the operation of the ICDF Complex. Other liquid wastes from CERCLA projects can also be disposed in the evaporation pond.

1.4.2 Related ICDF Complex WACs

Three WACs will be in effect in the ICDF Complex during operation of the landfill. They are briefly described below:

1. **ICDF Complex WAC**—The ICDF Complex WAC will encompass all waste entering the ICDF, including waste for landfill disposal, pond disposal, or for storage or off-Site shipment. Wastes meeting the ICDF Complex WAC must demonstrate that they meet the ICDF Evaporation Pond WAC in order to be accepted for disposal in the ICDF evaporation pond, and must meet the ICDF Landfill WAC to be accepted for disposal to the landfill. The ICDF Complex WAC contains the WAC components that apply to all wastes incoming to the complex, regardless of the intended final disposal.
2. **ICDF Landfill WAC**—This WAC specifies the requirements for waste that will be disposed in the ICDF landfill.
3. **ICDF Evaporation Pond WAC**—This WAC specifies the requirements for waste to be disposed in the ICDF evaporation pond.

Integration between the various WACs will be achieved, by use of the ICDF Complex WAC as the master document, and through the use of the same waste profile by all facilities. The waste profile will help provide consistent documentation of the waste during shipment or transfer.

The following documents were developed in support of the ICDF Complex, including the ICDF evaporation pond design and ICDF Evaporation Pond WAC:

- **Leachate Generation Study (DOE-ID 2001c)**—The Leachate Generation Study was used to determine how much leachate would be generated during normal landfill operations, and the volume of leachate that would be generated by the 25-year, 24-hour storm event. This includes a water balance to determine the amount of leachate expected to be generated based on precipitation, moisture content of incoming waste, water added for dust control and compaction, and evaporation.
- **Leachate/Contaminant Reduction Time Study (DOE-ID 2001d)**—The Leachate/Contaminant Reduction Time Study calculated the amount of radionuclides expected in the leachate based on the waste inventory and the geochemistry of the waste and water.
- **Fate and Transport Modeling Results Summary Report (DOE-ID 2001e)**—The Fate and Transport Modeling Study determined the impact of the ICDF and the ICDF evaporation pond on the SRPA.
- **Liner/Leachate Compatibility Study (DOE-ID 2001f)**—The Liner/Leachate Compatibility Study was performed to determine the compatibility study of materials proposed for the ICDF landfill liner system and expected waste leachate. The study concluded that the manufacturer-recommended limits associated with the HDPE geomembrane liners were several orders of magnitude higher than the estimated maximum ICDF landfill leachate concentrations. A GSE® 60-mm HDPE geomembrane liner has been specified for the ICDF evaporation pond. Because the liner is acceptable for the landfill, it will also meet the requirements of the ICDF evaporation pond. Based on results of the study, hazardous constituent concentration limits necessary to ensure liner integrity were established. The study did not show any threat to the liner from radionuclides present in the waste to be managed at the ICDF landfill.

- **Evaporation Pond Sizing and Water Balance Calculations (DOE-ID 2001g)**—These calculations determined the size and depth of the evaporation pond based on leachate generation, precipitation, effluent from the SSSTF treatment processes, purge/development water from CERCLA groundwater monitoring wells, and evaporative potential.

1.5 Responsibilities

Responsibilities for use of the ICDF Complex are described in the ICDF Complex WAC, Section 1.5. Responsibilities specific only to the evaporation pond are described in the following sections.

1.5.1 Evaporation Pond Management

The ICDF evaporation pond management will include the selected organizations assigned to operate the ICDF Complex. These personnel will be responsible for:

- Maintaining the WAC document for the ICDF evaporation pond
- Review and approval/rejection of requests for disposal of aqueous wastes based on health and safety, the waste acceptance documents, and environmental regulations
- Maintaining a proactive quality assurance (QA) program for timely identification of deficiencies and implementation of appropriate corrective actions, including verification procedures to ensure that incoming wastes meet the ICDF Evaporation Pond WAC
- Conducting periodic inspections of the pond
- Leak detection monitoring.
- Oversight of off-loading events

1.5.2 Evaporation Pond Users (DOE-ID and Subcontractors)

The users of the ICDF evaporation pond will be required to:

- Participate in planning discussions and submit long-term operational project schedules that involve ICDF evaporation pond usage.
- Develop, document, and implement appropriate waste sampling and analysis plans when required for development of waste profiles.
- Prepare aqueous waste profiles, hazardous waste determination, and obtain ICDF Complex Operations Manager acceptance for each aqueous waste source or group of aqueous waste sources, that will be disposed in the ICDF evaporation pond.
- For waste not in the design basis, compare the new waste with the WAC for the ICDF evaporation pond, and determine if the new waste is within the acceptable limits. If it is within acceptable limits, then a special case exemption may be required before disposal.
- Obtain and/or confirm ICDF Complex Operations Manager's authorization for disposal of the aqueous waste in the ICDF evaporation pond.

- Transport approved aqueous wastes to the SSSTF.

2. WASTE PROFILE PROCESS

The waste profile process is described in Section 2 of the ICDF Complex WAC (DOE-ID 2001b); see Table 1-1.

2.1 General Requirements

General requirements of the waste profile process are described in Section 2.1 of the ICDF Complex WAC (DOE-ID 2001b); see Table 1-1. The waste profile sheets are the same for all ICDF Complex units.

2.2 General Class of Waste

General classes of waste are described in Section 2.2 of the ICDF Complex WAC (DOE-ID 2001b); see Table 1-1. Wastes specific to the evaporation pond are described below.

Table 2-1. Summary of acceptable types of wastes for the ICDF Evaporation Pond WAC.

Waste Type Accepted at the ICDF	Content Accepted
ICDF leachate	All ICDF leachate is acceptable.
INEEL CERCLA-generated liquid hazardous waste (other than ICDF leachate)	Listed or characteristic CERCLA-generated hazardous waste can be accepted at the ICDF evaporation pond if it meets the concentration criteria. LDRs do not apply, because the ICDF evaporation pond is a CAMU.
CERCLA-generated radioactive waste	Radioactive waste must meet the radiological evaporation pond WAC.
CERCLA-generated secondary aqueous waste	Secondary waste generated within the ICDF Complex must meet the applicable hazardous and radioactive ICDF Evaporation Pond WAC.
CERCLA-generated mixed waste	Mixed waste must meet both the hazardous and radioactive ICDF Evaporation Pond WAC.
CERCLA-generated well purge/development water	Well purge/development water will be accepted at the ICDF evaporation pond if it meets the hazardous and radiological evaporation pond WAC.

Each of the wastes listed in Table 2-1 is further described in a subsequent section, and guidelines for the waste profile appear in Section 3 of the ICDF Complex WAC.

2.3 Composition and Waste Containers

Composition and waste containers are described in Section 2.3 of the ICDF Complex WAC; see Table 1-1. Details specific to the evaporation pond are in the following sections.

Waste containers may be used to transport liquid wastes to the ICDF evaporation pond, Waste containers must be capable of being discharged to the pond via pumping at the pump station. Tanker trucks and large volume tanks on flatbeds will be acceptable containers.

2.4 Physical and Chemical Characterization

Physical and chemical characterization requirements are described in Section 2.4 of the ICDF Complex WAC; see Table 1-1. Characterization that is specific only to the evaporation pond is found in the following sections.

2.4.1 Type of Acceptable Knowledge

Types of Acceptable Knowledge are described in Section 2.4.1 of the ICDF Complex WAC (DOE-ID 2001b). Types of Acceptable Knowledge requirements specific to the ICDF Evaporation Pond WAC are:

- Analytical results from previous sampling of the same well.

If the information is sufficient to quantify constituents and characteristics, as required by the regulations and unit-specific acceptance criteria, the information is considered acceptable knowledge.

2.4.2 Land Disposal Restriction Knowledge

Because the ICDF evaporation pond is a CAMU, LDRs do not apply to waste disposed to the ICDF evaporation pond.

2.5 Radiological Characterization

Radiological Characterization requirements are described in Section 2.5 of the ICDF Complex WAC (DOE-ID 2001b); see Table 1-1.

3. WASTE ACCEPTANCE PROCESS

The waste acceptance process is described in Section 3 of the ICDF WAC; see Table 1-1. Parts of the process that are specific to the evaporation pond are described in the following sections.

3.1 Planning

The waste planning process is described in Section 3 of the ICDF WAC. Parts of the process that are specific to the evaporation pond are described in the following sections.

3.2 Waste Acceptance Scheduling Requirements

Waste acceptance scheduling requirements are described in Section 3.2 of the ICDF Complex WAC (DOE-ID 2001b); see Table 1-1.

3.3 Waste Tracking System

The waste tracking system is described in Section 3.3 of the ICDF Complex WAC (DOE-ID 2001b); see Table 1-1.

3.4 Data Quality Objectives

Data quality objectives are described in Section 3.4 of the ICDF Complex WAC (DOE-ID 2001b); see Table 1-1.

3.5 Waste Profile

The waste profile is described in Section 3.5 of the ICDF Complex WAC (DOE-ID 2001b); see Table 1-1. Waste profile processes specific to the evaporation pond are described in the following sections.

3.5.1 ICDF Leachate

The ICDF leachate will be discharged directly to the ICDF evaporation pond. The ICDF Complex Operations Manager will be responsible for preparing waste profile sheets for the leachate. The leachate management system will record volumes of leachate pumped to the ICDF evaporation pond. The ICDF management may elect to track the concentrations of key indicator parameters contained in the leachate, as measured in the evaporation pond.

3.5.2 ICDF Complex Aqueous Wastes (Non-Leachate)

The ICDF Complex Operations Manager will be responsible for preparing the waste profiles and designating the wastes that are generated inside the ICDF Complex. Individual discharges of aqueous waste to the ICDF evaporation pond must be accompanied by a waste profile sheet, but separate analytical data are not required for each discharge of water from the same source (e.g., decontamination water). However, the volumes from non-leachate sources will be tracked and recorded.

3.5.3 Non-ICDF Complex Wastes

The generating WAGs or projects must complete a waste profile for wastes to be stored at the ICDF Complex. The initial aqueous waste stored at the SSA will have analytical data available before the ICDF evaporation pond is operational. Subsequent aqueous waste from the same sources (purge water from the same wells, for example) will be accepted with a new waste profile that can be prepared on the basis of the initial waste profile. Aqueous waste from new waste sources must be accompanied by a waste profile with analytical data or sufficient process knowledge to show that the waste meets the ICDF Evaporation Pond WAC.

3.6 Waste Certification Process

The waste certification process is described in Section 3.6 of the ICDF Complex WAC (DOE-ID 2001b); see Table 1-1.

3.7 Verification as Packaged

Verification of the waste as packaged is described in Section 3.7 of the ICDF Complex WAC (DOE-ID 2001b); see Table 1-1.

3.8 Receipt Verification

Waste receipt verification is described in the ICDF Complex WAC (DOE-ID 2001b); see Table 1-1.

3.9 Non-Conforming Waste

Waste received with non-compliant conditions is described in Section 3.9 of the ICDF Complex WAC (DOE-ID 2001b); see Table 1-1.

3.10 Records

Records requirements are described in Section 3.10 of the ICDF Complex WAC (DOE-ID 2001b); see Table 1.1.

3.11 Packaging and Shipping

Waste packaging and shipping requirements are described in Section 3.11 of the ICDF Complex WAC (DOE-ID 2001b); see Table 1-1. Evaporation pond specific requirements are discussed below.

3.11.1 Packaging and Shipping

Packaging and shipping are described in Section 3.11 of the ICDF Complex WAC (DOE-ID 2001b).

3.12 Waste Delivery

3.12.1 ICDF Leachate

The ICDF leachate will be pumped to the ICDF evaporation pond from the leachate collection sump.

3.12.2 Other Wastes

The monitoring well purge and development water will be delivered in tanker trucks, 55-gal drums, or pumped directly to the pond from trucks, tanks, trailer tanks, or drums. The decontamination water will be collected in a lift station and pumped to the ICDF evaporation pond by pressure pipeline. As an option, tanker trucks could be used to transfer the decontamination wastewater and purge water stored at the SSSTF SSA facility to the ICDF evaporation pond.

4. WASTE ACCEPTANCE BASIS

4.1 Criteria Basis

The basis for acceptance criteria includes protection of human health (including worker health and safety), compliance with ARARs per the OU 3-13 ROD to protect human health and the environment, compliance with applicable DOE orders, and best management practices.

4.1.1 Remedial Design Analysis

The WAC is based on the CERCLA Disposal Facility Design Inventory (DOE-ID 2001h) and the results of the studies summarized in Table 4-1.

Table 4-1. Summary of ICDF study results influencing the ICDF WAC.

Document	Summary of results
Draft Leachate/Contaminant Reduction Time Study (DOE-ID 2001d)	This study provides the content of a hypothetical ICDF leachate based on the CERCLA Disposal Facility Design Inventory (DOE-ID 2001h). It provides the modeled composition of the leachate during the operations period, taking into account solubility, soil-water partitioning, and radioactive decay, using a combination of K_d s and geochemistry modeling. An operational period of 15 years was assumed for the ICDF landfill.
Draft Fate and Transport Modeling Results Summary Report (DOE-ID 2001e)	This study estimated contaminant fate and transport (100,000 year simulations) through the vadose zone to a hypothetical monitoring well located 20 meters (m) downgradient of the ICDF in the SRPA.
Draft Liner/Leachate Compatibility Study (DOE-ID 2001f)	This study indicates that the main chemical threat to the ICDF would be organic constituents. Organic constituents would have to be present at concentrations several orders of magnitude higher than the Design Basis Inventory organic constituents before they could be considered a problem for liner compatibility. A GSE® 60-mm HDPE geomembrane liner has been specified for the ICDF evaporation pond. Because the liner is acceptable for the landfill, it will also meet the requirements of the ICDF evaporation pond. Based on results of the study, hazardous constituent concentration limits necessary to ensure liner integrity were established. The study did not show any threat to the liner from radionuclides present in the waste to be managed at the ICDF landfill.

4.1.2 Protection of Human Health and the Environment

Occupational exposure for radiological and chemical contaminants will be maintained as low as reasonably achievable (ALARA). During the operational phase, operating procedures developed for the ICDF evaporation pond will be followed. The operational procedures will protect the environment by complying with environmental regulations called out in the OU 3-13 ROD as applicable or relevant and appropriate requirements (ARARs). Protection of human health and the environment were used in the development of the chemical-specific WAC for the evaporation pond, as discussed in Section 4.2 and presented in the WAC tables in Section 5.

Worker protection shall be provided by compliance with the requirements of the site-specific health and safety program for the ICDF Complex operations (INEEL/EXT-01-00033). Protection of the public will be based on the National Emission Standard for Hazardous Air Pollutants (NESHAPs) modeling of radionuclide exposure to constituents in the evaporation pond.

4.1.3 Protection of the ICDF Evaporation Pond Liner System

A compatibility study of materials proposed for the ICDF evaporation pond landfill liner system and expected waste leachate was performed as part of the Evaluation of Liner/Leachate Chemical Compatibility for the ICDF. The study concluded that the manufacturer-recommended limits associated with the high-density geomembrane liners were several orders of magnitude higher than the estimated maximum ICDF evaporation pond landfill leachate concentrations. Liner compatibility concentrations for expected organic chemicals will be included in Appendix A of this document when the Liner/Leachate Compatibility study is complete. Based on results of the study, hazardous constituent concentration limits necessary to ensure liner integrity were established. The study did not show any threat to the ICDF evaporation pond liner from radionuclides present in the waste to be managed at the ICDF landfill. Waste with constituents in sufficient concentration that could result in loss of ICDF evaporation pond liner integrity shall not be accepted as outlined in Section 5.

The ICDF Complex management shall evaluate waste with chemical constituents not listed in this document on a case-by-case basis to determine liner compatibility. The evaluation shall consist of a paper study showing that the new waste constituents are chemically equivalent to an approved constituent. If chemical equivalency cannot be determined through a paper study, EPA Method 9090 may be required to show that the aqueous waste is compatible with the liner material.

4.1.4 Compliance with ARARs

The pond will be designed and operated in compliance with the ARARs. The majority of ARARs fall into broad categories that relate to design and operation, release detection, and monitoring. For example, the regulations in 40 CFR Subpart K, 264.221 *Surface Impoundment Design and Operating Requirements* will be used as a basis for design requirements for the ICDF evaporation pond. ARARs that affect the WAC are those that limit what types of waste and what concentrations/activities of contaminants are allowed to enter the pond. These ARARs are discussed below.

4.1.4.1 The Corrective Action Management Unit. The OU 3-13 ROD (page 11-15) states:

“Based on currently available cost information, all Group 3 soils will be disposed in the ICDF. This approximately 80 acre area (including a buffer zone) will be engineered to be TSCA/RCRA-compliant for the purpose of final placement of WAG 3 CERCLA soils. The ICDF will also be designed to function as an INEEL-wide disposal facility to accommodate disposal of CERCLA soils and debris from other WAGS. A Staging, Storage, Sizing, and Treatment Facility (SSSTF) will also be constructed and operated to prepare CERCLA wastes (i.e., soil, debris, and aqueous wastes, such as purge and decontamination waters) as necessary, for disposal in the ICDF. It is anticipated that this facility will consist of a storage/staging building, an evaporation pond or equivalent surface impoundment, a waste shredder, solidification/stabilization treatment tanks, and associated systems. The evaporation pond will be designated as a Corrective Action Management Unit (CAMU). The evaporation pond will be designed and constructed to treat ICDF leachate and other aqueous wastes generated during operations.”

On the basis of the above ROD language, the intent of the ICDF Complex Facility was to accept CERCLA waste from all INEEL WAGs. Therefore, CERCLA-generated aqueous waste from within the INEEL that meets the evaporation pond WAC can be accepted into the evaporation pond without further treatment.

The CAMU rule (40 CFR 264.552) has the most effect on the WAC. The ICDF evaporation pond is designated as a CAMU unit in the OU 3-13 ROD. CAMU “means an area within a facility that is used only for managing remediation wastes for implementing corrective action or cleanup at the facility.” For

purposes of this WAC, the INEEL is considered “the facility.” Subpart S of 40 CFR 264 specifically provides for Corrective Action for Solid Waste Management Units or CAMU in 40 CFR 264.552(a):

To implement remedies under 264.101 or RCRA 3008 (h) or to implement remedies at a permitted facility that is not subject to 264.101, the Regional Administrator may designate an area at the facility as a corrective action management unit, as defined in 260.10, under the requirements in this section. A CAMU must be located within the contiguous property under the control of the owner/operator where the wastes to be managed in the CAMU originated. One or more CAMUs may be designated at a facility.

- (1) Placement of remediation waste into or within a CAMU does not constitute land disposal of hazardous wastes.
- (2) Consolidation or placement of remediation wastes into or within a CAMU does not constitute creation of a unit subject to minimum technology requirements.

4.1.4.2 IDAPA 58.01.05.008 (40 CFR 264.221[c][2]). These standards give specific requirements for a leachate collection and removal system below the impoundment, including 264.221. (c)(2)(iii) “Constructed of materials that are chemically resistant to the waste managed in the surface impoundment and the leachate expected to be generated . . .”

4.1.4.3 IDAPA 58.01.05.008 (40 CFR 264, Subpart BB) Air Emissions Standards for Equipment Leaks. These standards apply to equipment that contains or contacts hazardous wastes with organic concentrations of at least 10% by weight. The standards are for specific pieces of equipment (c.g., pumps, compressors, and pressure relief valves).

4.1.4.4 IDAPA 58.01.05.008 (40 CFR 264, Subpart CC) Air Emission Standards for Tanks, Surface Impoundments, and Containers. The standard 40 CFR 264.1082(c)(1) provides:

- A tank, surface impoundment, or container for which all hazardous waste entering the unit has an average volatile organic (VO) concentration at the point of waste origination of less than 500 parts per million (ppm) by weight. The average VO concentration shall be determined using the procedures in 264.1083 (a) of this subpart. The owner or operator shall review and update, as necessary, this determination at least once every 12 months following the date of the initial determination for the hazardous waste streams entering the unit.

Also, the entire Subpart CC Air Emission Standards for Tanks, Surface Impoundments, and Containers (IDAPA 58.01.05.008 [40 CFR 264.1080 through 1090]) has a specific exemption for remedial actions under CERCLA:

- “40 CFR 264.1080 (b) The requirements of this subpart do not apply to the following waste management units at the facility: (5) A waste management unit that is solely for on-site treatment or storage of hazardous waste that is placed in the unit as a result of implementing remedial activities required under the corrective action authorities of RCRA sections 3004 (u), 3004 (v), or 30008 (h); CERCLA authorities; or similar Federal or State Authorities.”
- 40 CFR 61.92 *National Emission Standards for Hazardous Air Pollutants (NESHAPs) for radionuclides from DOE*. This regulation states, “Emissions of radionuclides to the ambient air from Department of Energy facilities shall not exceed those amounts that would cause any member of the public to receive in any year an effective dose equivalent of 10 mRem/yr.”

- 40 CFR 61.93 *Facilities, Emission Monitoring and Emission Compliance*. This regulation specifies how compliance with 40 CFR 61.92 is demonstrated.

4.2 Development of Chemical and Radiological WAC for the Evaporation Pond

The WAC for the evaporation pond was calculated by determining the lowest risk-based concentration (RBC) for all of the constituents in the design inventory for the pond worker and visitor risk scenarios. Only the organic and inorganic RBC numbers are available at the 60% design stage. The ICDF evaporation pond Tier 1 WAC development logic is shown in the flow diagram (Figure 4-1). Volatile organic exposure scenarios were developed for site workers (8-hr/day, 2080 hr/year) working within the ICDF, and site visitors (8-hr /day 1 day/year at the ICDF fenceline). The allowable carcinogenic and non carcinogenic risk was determined. Of the risk limits, the lowest concentration was selected. The scenario that was most restrictive was worker exposure due to the duration of exposure. The concentration that was protective of workers will be compared to liner compatibility criteria, and the lowest number was selected. If the expected leachate contaminant concentrations exceed ecological risk criteria for direct exposure (e.g., waterfowl and other wildlife visiting the ponds), then engineered controls (e.g., fences, barriers, bird screens, etc.) will be evaluated for implementation as an alternative to reducing the WAC to meet that criterion.

Modeling was performed to demonstrate compliance with National Emission Standard for Hazardous Air Pollutant (NESHAPs) (DOE-ID 2001i). The INEEL site boundary was used as the location where the maximally exposed individual (MEI) of the public is located. The radioactive dose from the normal operation of the landfill and the evaporation pond was calculated at this location. The modeling showed no impact at the fenceline. The dose was based on the “INEEL CERCLA Disposal Facility Design Inventory,” (DOE-ID 2001h).

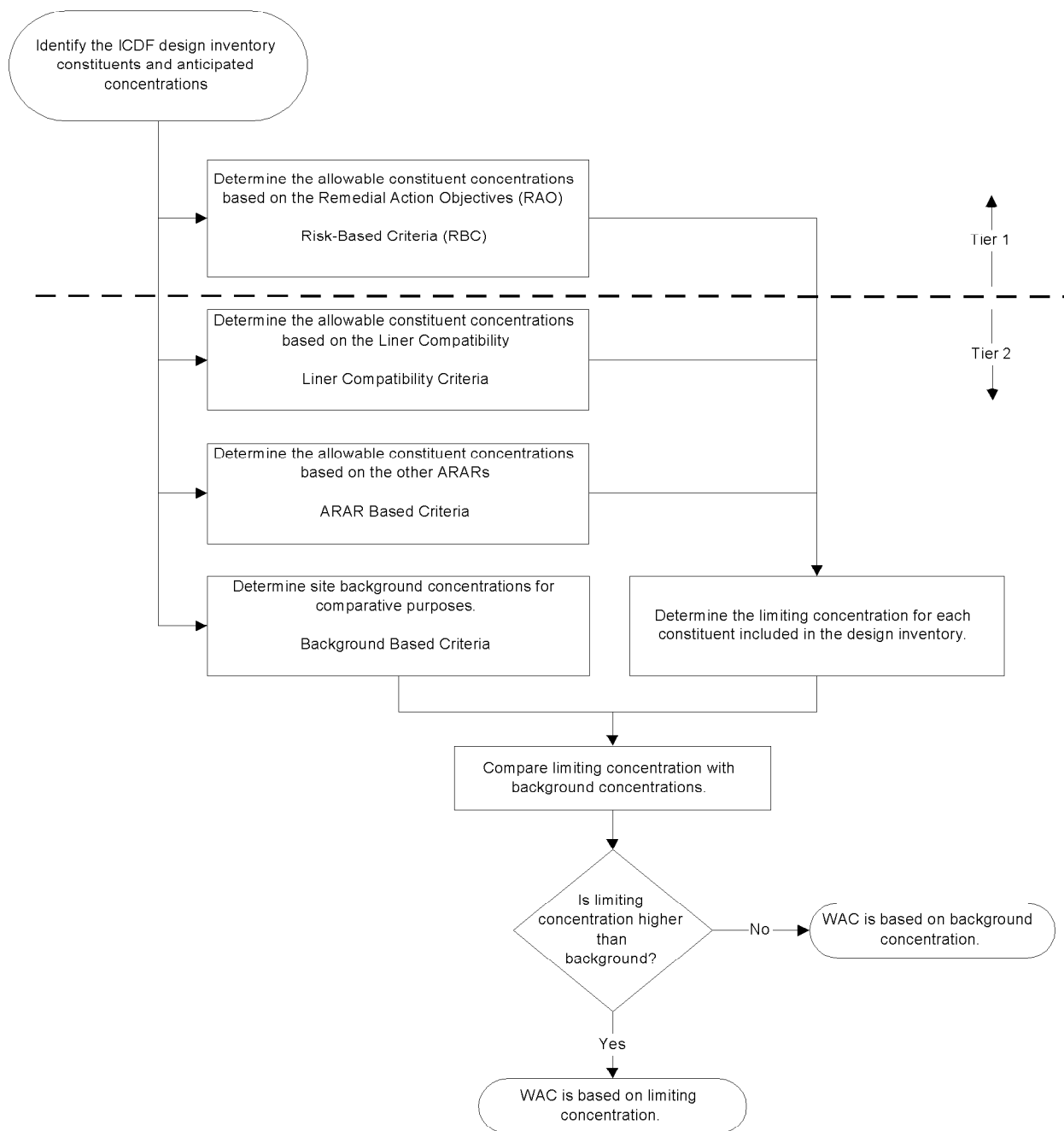


Figure 4-1. ICDF evaporation pond Waste Acceptance Criteria development logic.

5. ACCEPTANCE CRITERIA FOR THE ICDF EVAPORATION POND

5.1 Prohibited Waste

The materials prohibited from disposal at the ICDF evaporation pond are described in this section.

5.1.1 TRU Constituent Waste >10 nCi/gmL

Waste containing greater than 10 nanocuries per gram (nCi/g) of TRU radionuclides is prohibited from disposal at the ICDF evaporation ponds.

5.1.2 TSCA Waste

TSCA waste is prohibited from disposal at the ICDF evaporation pond.

- Asbestos waste is not aqueous waste
- PCB wastes are prohibited from direct disposal to the pond. The evaporation pond is not designed to meet TSCA standards for PCB wastes. Landfill leachate, FO39, has a PCB component, and PCBs may be present in the landfill leachate.

Other wastes prohibited from disposal at the ICDF evaporation pond are listed below:

5.1.3 Waste Capable of Detonation, Explosive Decomposition, or Reaction at Normal

Waste capable of detonation, explosive decomposition, or reaction at normal pressures and temperature, or explosive reaction with water (DOE Manual 435.1, IV G (d) (3)). This includes unreacted alkali metal (e.g., sodium). Chemicals that react with atmospheric oxygen to form shock-sensitive organic peroxides are prohibited at concentrations that are capable of generating an explosive reaction.

5.1.4 Waste Capable of Generating Toxic Gases, Vapors, or Fumes

1. Waste capable of generating toxic gases, vapors, or fumes harmful to persons transporting, handling, and disposing the waste (Manual 435.1 IV G (d) (4)).

5.1.5 Hazardous Waste with Greater than 500 ppm Volatile Organic Compounds

Hazardous waste with greater than 500 ppm volatile organic compounds are prohibited. This gives the evaporation pond an exemption from IDAPA 58.01.05.05.008 (40 CFR 264 Subpart CC).

5.1.6 Waste Exceeding the Class C Limit, as Defined in 10 CFR 61.55

Waste exceeding the Class C limit, as defined in 10 CFR 61.55 are prohibited per 10 CFR 61.55.

5.1.7 Waste Containing Greater than 1% Chelating Compounds by Weight

Waste containing greater than 1% chelating compounds by weight are prohibited. Chelating compounds can mobilize contaminants, and could potentially cause an exceedence of groundwater RAOs.

5.1.8 Spent Nuclear Fuel and High-Level Waste

Spent nuclear fuel and high-level waste are prohibited by the DOE Radiological Waste Management Manual Chapter II A (DOE-ID 1999b).

5.2 Waste Requiring Treatment

Wastes requiring treatment are listed in Table 5.2.

Table 5-1. Materials restricted from disposal at the ICDF evaporation pond until the listed conditions have been met.

Restricted Material	Condition to be Met
Refrigerant-bearing equipment containing chlorofluorocarbons (CFCs)	CFC removal has been completed (40 CFR 82)
Pyrophoric waste	Must be treated, to be nonflammable prior to being disposed
Liquid acid waste that exhibits the characteristic of low pH under the corrosivity tests of 40 CFR 261.22	Must be neutralized ^a
Infectious waste, as defined in 10 CFR 61 (including “any substance that may harbor or transmit pathogenic organisms,” which may apply to septic tank sludge).	Must be disinfected

^aNeutralization for protection for the liner system.

5.3 Physical and Chemical Criteria

5.3.1 Liquid Waste

The ICDF evaporation pond is designed to accept only liquid (aqueous) wastes.

5.3.2 Land Disposal Restrictions

Land disposal restrictions do not apply to the ICDF evaporation pond.

5.3.3 Heat Generation

Aqueous waste must be in a liquid form. Hot aqueous waste above the ambient temperature will not be accepted until it has cooled.

5.3.4 Gas Generation

Liquid wastes which, upon discharge into the ICDF evaporation pond, could result in the generation of toxic gases will not be accepted into the ICDF evaporation pond.

5.4 Chemical Waste Acceptance Criteria

Logic for development of the maximum allowable risk-based chemical and radiological concentrations in the WAC is shown in Figure 4-1. The organic chemical WAC limits are shown in Table 5-2.

Table 5-2. Organic Waste Acceptance Criteria for evaporation pond.

Noncarcinogenic Organic Chemical	Noncarcinogenic Worker Exposure RBC WACs (mg/L)
1,1,1-Trichloroethane	8.40E+00
1,1-Dichloroethane	8.02E+00
1,2,4-Trichlorobenzene	2.85E-01
1,2-Dichlorobenzene	4.68E-01
1,2-Dichloroethene (total)	5.00E-01
1,3-Dichlorobenzene	5.17E-03
2-Butanone	1.30E+02
2-Chloronaphthalene	2.50E-01
2-Chlorophenol	2.27E-01
2-Methylnaphthalene	6.66E-02
2-Nitroaniline	5.49E-03
3-Nitroaniline	5.49E-03
4-Methyl-2-Pentanone	3.46E+00
4-Nitroaniline	5.49E-03
Acenaphthene	1.20E-01
Acenaphthylene	3.15E-01
Acetone	8.76E+01
Acetonitrile	1.39E+01
Acrolein	3.86E-03
Anthracene	6.81E-01
Carbon Disulfide	4.16E+00
Chlorobenzene	2.07E-01
Dibenzofuran	1.33E-02
Ethylbenzene	1.96E+00
Methyl Acetate	5.55E+02
Naphthalene	6.20E-03
Nitrobenzene	4.14E-02
Styrene	2.63E+00
Toluene	1.22E+00
Xylene (ortho)	1.25E+00
Xylene (total)	1.25E+00

Table 5-2. (continued).

Chemical	Carcinogenic Worker Exposure RBC WAC (mg/L)
1,1,2,2-Tetrachloroethane	4.93E-04
1,1,2-Trichloroethane	6.34E-04
1,1-Dichloroethene	6.46E-06
1,2-Dichloroethane	3.00E-04
1,4-Dichlorobenzene	6.58E-04
Acrylonitrile	1.23E-03
Benzene	1.99E-04
bis(2-Chloroethyl)ether	1.69E-03
bis(2-Chloroisopropyl)ether	9.44E-03
Chloroethane	8.38E-04
Chloromethane	1.72E-04
Methylene Chloride	7.56E-03
Tetrachloroethene	9.16E-04
Trichloroethene	5.20E-04

5.5 Radiological Criteria

5.5.1 Radiological Concentration Limits

Restrictions on the activity of radionuclides that can be placed in the ICDF evaporation pond will be determined on the basis of NESHAPs modeling, and in evaluating the potential impact to the SRPA from the ICDF evaporation pond. Radiological restrictions will also be based on a reasonably maximally exposed (RME) individual of the public calculated at 15 mREM/yr. In addition, ecological risks will be included in determining radiological restrictions at the 90% design stage.

Limits established for radionuclides will be identified in the 90% design document. Waste containing greater than 10 nCi/g of TRU isotopes based on waste stream sampling will not be accepted.

5.5.2 Criticality Safety Limits

Criticality safety limits are described in Section 5.4.3 of the ICDF Complex WAC (DOE-ID 2001b); see Table 1-1.

5.5.3 Non-Contact-Handled Wastes

Non-contact-handled waste shall meet the applicable dose rate restrictions of the Department of Transportation (DOT) or an approved packaging safety analysis. Remote-handled waste shall be configured for unloading such that personnel exposures are maintained ALARA.

5.6 Packaging Criteria

Packaging criteria are described in Section 5.5 of the ICDF Complex WAC (DOE-ID 2001b); see Table 1-1. Packaging criteria specific to the evaporation pond are described below.

5.6.1 Outer Packages

Criteria for outer packages are described in Section 5.5.1 of the ICDF Complex WAC (DOE-ID 2001b); see Table 1-1.

5.6.2 Condition of Containers

Condition of containers is described in Section 5.5.2 of the ICDF Complex WAC (DOE-ID 2001b); see Table 1-1.

5.6.3 Aqueous Waste Transfer

The majority of non-leachate waste is expected to be delivered to the ICDF evaporation pond by pumping from bulk liquid containers. This waste may arrive in water trucks, water trailers, tanks, or other containers.

5.6.4 Package Labeling and Marking

Package labeling and marking criteria are described in Section 5.5.6 of the ICDF Complex WAC.

5.6.5 Bulk Containerized Aqueous Waste

The majority of non-leachate waste is expected to be delivered to the ICDF evaporation pond by pumping from bulk liquid containers. This waste may arrive in water trucks, water trailers, tanks, or other containers. Waste streams that comply with the ICDF evaporation pond WAC can be accepted for disposal at the ICDF evaporation pond as bulk shipments.

6. REFERENCES

- 40 CFR 61.92, 1999, "National Emission Standards for Hazardous Air Pollutants (NESHAPs) for radionuclides from DOE". *Code of Federal Regulations, Office of the Federal Register*, July 1, 1999.
- 40 CFR 61.93, 1999, "Facilities, Emission Monitoring and Emission Compliance," *Code of Federal Regulations, Office of the Federal Register*, July 1, 1999.
- 40 CFR 191, 1999, "Environmental Radiation Protection Standards for Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Wastes," *Code of Federal Regulations, Office of the Federal Register*, July 1, 1999.
- 40 CFR 260.10 , 1999, "Definitions," *Code of Federal Regulations, Office of the Federal Register*, July 1, 1999.
- 40 CFR 261.3, 1999, "Definition of Hazardous Waste" *Code of Federal Regulations, Office of the Federal Register*, July 1, 1999.
- 40 CFR 262, 1999, "Standards Applicable to Generators of Hazardous Wastes" *Code of Federal Regulations, Office of the Federal Register*, July 1, 1999.
- 40 CFR 264, 1999, "Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities" *Code of Federal Regulations, Office of the Federal Register*, July 1, 1999.
- 40 CFR 264.221, 1999, "Surface Impoundment Design and Operating Requirements" *Code of Federal Regulations, Office of the Federal Register*, July 1, 1999.
- 40 CFR 264.552 (Subpart S), 1999, "Corrective Action Management Units" *Code of Federal Regulations, Office of the Federal Register*, July 1, 1999.
- 40 CFR 264.1050 (Subpart BB), 1999, "Air Emission Standards For Equipment Leaks" *Code of Federal Regulations, Office of the Federal Register*, July 1, 1999
- 40 CFR 264.1080 (Subpart CC), 1999, "Air Emission Standards for Tanks, Surface Impoundments, and Containers" *Code of Federal Regulations, Office of the Federal Register*, July 1, 1999.
- DOE-ID, 2001a, "Pond Lining System Equivalency Analysis (Draft)," EDF-ER-312, Rev. 0, U.S. Department of Energy Idaho Operations Office, Idaho Falls, Idaho.
- DOE-ID, 2001b, "ICDF Complex Waste Acceptance Criteria," DOE/ID 10881, Rev. 0, August, 2001
- DOE-ID, 2001c, "Leachate Generation Study," EDF-ER 269, Rev. 0, U.S. Department of Energy Idaho Operations Office, Idaho Falls, Idaho.
- DOE-ID, 2001d, "Leachate/Contaminant Reduction Time," EDF-ER 274, Rev. 0, U.S. Department of Energy Idaho Operations Office, Idaho Falls, Idaho.
- DOE-ID, 2001e, "Fate and Transport Modeling Results," EDF-ER 275, Rev. 0, U.S. Department of Energy Idaho Operations Office, Idaho Falls, Idaho.

DOE-ID, 2001f, "Liner/Leachate Compatibility Study," EDF-ER 278, Rev. 0, U.S. Department of Energy Idaho Operations Office, Idaho Falls, Idaho.

DOE-ID, 2001g, "Evaporation Pond Sizing and Water Balance Calculations," EDF-ER 271, Rev. 0, U.S. Department of Energy Idaho Operations Office, Idaho Falls, Idaho.

DOE-ID, 2001h, "CERCLA Disposal Facility Design Inventory (Draft)," EDF-ER 264, Rev. 0, U.S. Department of Energy Idaho Operations Office, Idaho Falls, Idaho.

DOE-ID, 2001i, "NESHAP Modeling for ICDF Complex (Draft)," EDF-ER 290, Rev. 0, U.S. Department of Energy Idaho Operations Office, Idaho Falls, Idaho.

Federal Register, 1993, "Corrective Action Management Units and Temporary Units: Corrective Action Provisions Under Subtitle C," Vol. 58, No. 029 Part II FR 8658, Tuesday, February 16, 1993.

DOE-ID, 1999a, "Record of Decision: Final Record of Decision, Idaho Nuclear Technology and Engineering Center," DOE/ID-10660, Rev. 0, U.S. Department of Energy, Idaho Operations Office, Idaho Falls, Idaho.

DOE-ID, 1999b, "Manual 435.1-1 Radioactive Waste Management Manual."

Appendix A

Liner Compatibility Tables (from EDF 278)

(To be provided in the 90% deliverable)

Appendix B

RME and Risk Calculations

(To be provided in the 90% deliverable)